PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43*bis*.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IB2005/000427	03.02.2005	04.02.2004

International Patent Classification (IPC) or both national classification and IPC
A23C19/032

Applicant
DANISCO A/S

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:

European Patent Office - P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk - Pays Bas
Tel. +31 70 340 - 2040 Tx: 31 651 epo nl
Fax: +31 70 340 - 3016

Authorized Officer

Koch, J

Telephone No. +31 70 340-4307

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/IB2005/000427

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

   ☐ a sequence listing

   ☐ table(s) related to the sequence listing

   b. format of material:

   ☐ in written format

   ☐ in computer readable form

   c. time of filing/furnishing:

   ☐ contained in the international application as filed.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 29 (with respect to industrial applicability)

because:

☒ the said international application, or the said claims Nos. 29 (with respect to industrial applicability) relate to the following subject matter which does not require an international preliminary examination *(specify)*:

see separate sheet

☐ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. are so unclear that no meaningful opinion could be formed *(specify)*:

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the whole application or for said claims Nos.

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form	☐	has not been furnished
	☐	does not comply with the standard
the computer readable form	☐	has not been furnished
	☐	does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☒ See separate sheet for further details

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	10, 11, 12, 14, 15, 31, 32
	No:	Claims	1-9, 13, 16-30, 33-38
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-38
Industrial applicability (IA)	Yes:	Claims	1-28,30-38
	No:	Claims	

2. Citations and explanations

see separate sheet

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (SEPARATE SHEET)

International application No.
PCT/IB2005/000427

Re Item III

Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

Claim 29 relates to subject-matter considered by this Authority to be covered by the provisions of Rule 67.1(iv) PCT. Consequently, no opinion will be formulated with respect to the industrial applicability of the subject-matter of these claims (Article 34(4)(a)(I) PCT).

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:

D1: PETERSEN B L ET AL: "INFLUENCE OF CAPSULAR AND ROPY EXOPOLYSACCHARIDE-PRODUCING STREPTOCOCCUS THERMOPHILUS ON MOZZARELLA CHEESE AND CHEESE WHEY" JOURNAL OF DAIRY SCIENCE, AMERICAN DAIRY SCIENCE ASSOCIATION. CHAMPAIGN, ILLINOIS, US, vol. 83, no. 9, September 2000 (2000-09), pages 1952-1956, XP000967627 ISSN: 0022-0302

D2: WO 99/18807 A (UNILEVER N.V; UNILEVER PLC) 22 April 1999 (1999-04-22)

D3: LOW D ET AL: "ROLE OF STREPTOCOCCUS THERMOPHILUS MR-1C CAPSULAR EXOPOLYSACCHARIDEIN CHEESE MOISTURE RETENTION" APPLIED AND ENVIRONMENTAL MICROBIOLOGY, WASHINGTON,DC, US, vol. 64, no. 6, June 1998 (1998-06), pages 2147-2151, XP000925639 ISSN: 0099-2240

D4: PERRY D B ET AL: "EFFECT OF EXOPOLYSACCHARIDE-PRODUCING CULTURES ON MOISTURE RETENTION IN LOW FAT MOZZALELLA CHEES" JOURNAL OF DAIRY SCIENCE, AMERICAN DAIRY SCIENCE ASSOCIATION. CHAMPAIGN, ILLINOIS, US, vol. 80, no. 5, May 1997 (1997-05), pages 799-805, XP000657588 ISSN: 0022-0302

D5: PERRY D: "Manufacture of low fat mozzarella cheese using exopolysaccharide-producing starter cultures" JOURNAL OF DAIRY SCIENCE, AMERICAN DAIRY

SCIENCE ASSOCIATION. CHAMPAIGN, ILLINOIS, US, vol. 81, no. 2, 1998, pages 563-566, XP000740336 ISSN: 0022-0302

D6: HASSAN A. N. ET AL.: "Observation of bacterial exopolysaccharide in dairy products using cryo-scanning electron microscopy" INTERNATIONAL DAIRY JOURNAL, vol. 13, no. 9, 2003, pages 755-762, XP008046090

D7: BROADBENT JEFFERY R. ET AL.: "Use of exopolysaccharide-producing cultures to improve the functionality of low fat cheese" INTERNATIONAL DAIRY JOURNAL, vol. 11, no. 4-7, 2001, pages 433-439, XP002325765

D8: LOW D ET AL: "ZUR BEDEUTUNG VON STREPTOCOCCUS THERMOPHILUS MR-1C-KAPSELECO- POLYSACCHARID AUF DIE WASSERRETENTION IN KAESE. (ROLE OF STREPTOCOCCUS THERMOPHILUS MR-1C CAPSULAR EXOPOLYSACCHARIDE IN CHEESE MOISTURE RETENTION)" MILCHWISSENSCHAFT, VV GMBH VOLKSWIRTSCHAFTLICHER VERLAG. MUNCHEN, DE, vol. 54, no. 2, 1999, page 111, XP000825777 ISSN: 0026-3788

2. For the assessment of the present claim 29 on the question whether it is industrially applicable, no unified criteria exist in the PCT Contracting States. The patentability can also be dependent upon the formulation of the claims. The EPO, for example, does not recognize as industrially applicable the subject-matter of claims to the use of a compound in medical treatment, but may allow, however, claims to a known compound for first use in medical treatment and the use of such a compound for the manufacture of a medicament for a new medical treatment.

3. The application does not meet the requirements of Article 6 PCT, because claims 6-15, 19-26, 29, 34 and 37 are not clear.

3.1. Claim 6 refers to "said EPS production", which is, however, not mentioned to effectively take place in any of claims 1-5. This feature is therefore disregarded when assessing novelty and inventive step of claim 6.

3.2. Product claims 7 and 8 are rendered unclear by the method step "EPS is produced", which step can not be considered as further characterising the claimed product *as such*.

This feature is therefore disregarded when assessing novelty and inventive step of claims 7 and 8.

3.3. Claims 9-15 are considered as unclear, because they indirectly or directly depend on the unclear claim 7.
Claims 9-15 are therefore examined as if they were depending on claim 1.

3.4. Claims 19-26 and 34 merely specify results to be achieved ("wherein said EPS is capable of [...]"; "said EPS increases the stability"; "less than 5% loss in moisture during ripening" etc.), which can not be considered as technical features of the cheese product claimed. The respective features are therefore disregarded when assessing novelty and inventive step.

3.5. The purpose indicated in claim 29 is unclear due to the imprecise term "modulate" and the purpose therefore disregarded.

3.6. Claim 37 is not properly formulated to contain any technical feature.

4. Furthermore, the above-mentioned lack of clarity notwithstanding, the subject-matter of claims 1-9, 13, 16-30 and 33-38 is not new in the sense of Article 33(2) PCT, and therefore the criteria of Article 33(1) PCT are not met.

4.1. The document D1 discloses (cf. p. 1953, col. 1, §3; table 1; p. 1956, col. 1) a method for making Mozzarella cheese having increased moisture retention, wherein a culture comprising Lactobacillus helveticus (a commercial EPS negative cheese starter) and Streptococcus thermophilus MTC360 (an EPS positive lactic acid bacterium) is used. Moisture retention is considered as inevitably affecting the cheese texture.
The subject-matter of claims 1-8, 13, 16-30 and 33-38 is therefore not novel (Article 33(2) PCT).

4.2. The document D2 discloses (cf. example 1; claim 8) fresh cheese preparation using EPS positive Lactobacillus delbrueckii ssp. bulgaricus 291 and Streptococcus thermophilus as combined starter culture. The obtained cheese shows reduced graininess.

The subject-matter of claims 1-8, 13, 16-30 and 34-38 is therefore not novel (Article 33(2) PCT).

4.3. The document D3 discloses (cf. p. 2148, col. 1, §4; table 1; abstract) a method for making Mozzarella cheese having increased moisture retention, wherein a culture comprising e.g. Lactobacillus helveticus (an EPS negative cheese starter) and Streptococcus thermophilus MR-1C (an EPS positive lactic acid bacterium) is used. Moisture retention is considered as inevitably affecting the cheese texture.
The subject-matter of claims 1-8, 13, 16-30 and 33-38 is therefore not novel (Article 33(2) PCT).

4.4. The document D4 discloses (cf. the whole document) a method for making Mozzarella cheese having increased moisture retention, wherein a starter culture comprising Streptococcus thermophilus MR-1C (an EPS positive lactic acid bacterium) and Lactobacillus delbrueckii ssp. bulgaricus MR-1R (an EPS positive lactic acid bacterium) is used. Moisture retention is considered as inevitably affecting the cheese texture.
The subject-matter of claims 1-8, 13, 16-30 and 33-38 is therefore not novel (Article 33(2) PCT).

4.5. The document D5 discloses (cf. the whole document) a method for making Mozzarella cheese having increased moisture retention, wherein a starter culture comprising Streptococcus thermophilus MR-1C (an EPS positive lactic acid bacterium) and Lactobacillus delbrueckii ssp. bulgaricus MR-1R (an EPS positive lactic acid bacterium) is used. Moisture retention is considered as inevitably affecting the cheese texture.
The subject-matter of claims 1-8, 13, 16-30 and 33-38 is therefore not novel (Article 33(2) PCT).

4.6. The document D6 discloses (cf. p. 756, col. 2, §2; figures 1& 3) a method for making Mozzarella cheese, wherein an EPS-producing starter culture comprising e.g. Streptococcus thermophilus CHCC 3534 and Lactobacillus delbrueckii ssp. bulgaricus CHCC 769 is used. The cheese obtained exhibits increased moisture retention and a modified texture compared to control cheese prepared using non-

EPS-producing strains (cf. fig. 3).
The subject-matter of claims 1-8, 13, 16-30 and 33-38 is therefore not novel (Article 33(2) PCT).

4.7. The document D7 discloses (cf. abstract) a method for making Mozzarella cheese having increased moisture retention, wherein an EPS-producing starter culture comprising Streptococcus thermophilus MR-1C and Lactobacillus delbrueckii ssp. bulgaricus MR-1R is used. Moisture retention is considered as inevitably affecting the cheese texture.
The subject-matter of claims 1-8, 13, 16-30 and 33-38 is therefore not novel (Article 33(2) PCT).

4.8. The document D8 discloses (cf. p. 111, col. 2, §4) a method for making Mozzarella cheese having increased moisture retention, wherein an EPS-producing starter culture comprising Streptococcus thermophilus MR-1C and Lactobacillus helveticus LH100 is used. The EPS produced by MR-1C is a hetero-EPS comprising galactose, rhamnose and fucose units. Moisture retention is considered as inevitably affecting the cheese texture.
The subject-matter of claims 1-9, 13, 16-30 and 33-38 is therefore not novel (Article 33(2) PCT).

5. Dependent claims 10, 11, 12, 14, 15, 31 and 32 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, the reasons being as follows:
In claims 10, 11, 12, 14, 15, 31 and 32, slight changes in the product of claim 1 and the process of claim 30, respectively, are defined which come within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen.
Consequently, the subject-matter of these claims also lacks an inventive step.